

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference AA 1166	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI2005/000009	International filing date (day/month/year) 07-01-2005	Priority date (day/month/year) 17-02-2004
International Patent Classification (IPC) or national classification and IPC See Supplemental Box		
Applicant Finnketju Invest Oy et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:

☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand 15-06-2005	Date of completion of this report 21.02.2006
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Mariana Eddin/EK Telephone No. +46 8 782 25 00

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: Cover sheet

INTERNATIONAL PATENT CLASSIFICATION (IPC) :

B01D 21/18 (2006.01)

B01D 21/06 (2006.01)

B65G 19/20 (2006.01)

F16G 13/10 (2006.01)

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Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

the international application in the language in which it was filed

a translation of the international application into _____ ,
which is the language of a translation furnished for the purposes of:

international search (Rules 12.3(a) and 23.1(b))



publication of the international application (Rule 12.4(a))



international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

the international application as originally filed/furnished



the description:

pages 1 - 7 _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____



the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 9 - 11 received by this Authority on 15-06-2005

pages* _____ received by this Authority on _____



the drawings:

pages 1 - 8 _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____



a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

the description, pages _____



the claims, Nos. _____



the drawings, sheets/figs _____

the sequence listing (*specify*): _____any table(s) related to the sequence listing (*specify*): _____4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____



the claims, Nos. _____



the drawings, sheets/figs _____

the sequence listing (*specify*): _____any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-8</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-8</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-8</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The present invention relates to a scraper comprising an elongated, at least tension transmitting flexible structure, formed of formed pieces and meant to be used for scraping of substance in a liquid basin. In order to provide a scraper bar less stiff that restricts and removes substances from a fluid surface, the scraper is formed of pieces joined together by joint connections enabling successive pieces to twist around an axis standing in a direction of height and around an axis essentially in the longitudinal direction of the chain.

Reference is made to the following document/documents:

D1: US 1775680 A
D2: WO 0228750 A1
D3: FI 100322 B
D4: WO 0170603 A1

D1 shows a scraper conveyor and is considered to represent the most relevant state of the art. It comprises an elongated tension transmitting flexible structure formed of two kinds of formed pieces coupled with each other, one after the other in a longitudinal direction. The pieces are arranged to twist in respect to each other round a vertical axis (5) by means of a joint arrangement that comprises edge projections (4), vertically apart and on top of each other on the end of one formed piece (3), and a centre projection in the following formed piece (1), placed between the above edge projections. A spherical bearing (6,4,1) is arranged to enable rocking of the successive formed pieces (1,3) in respect to each other.

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: BOX V

The invention according to the amended claims differs from the scraper conveyor in D1 mainly in that it is meant to be used as a surface scraper in a fluid basin, such as a clarification basin or like, or as an oil containment boom or like and in that the specific weight of the scraper is arranged essentially lighter than water. Due to these features, it is possible, in addition to restricting of oil that exists on the water, also to remove it since the scraper "lives" along with the surface of the water.

The subject-matter of the amended claims is therefore novel (Article 33(2) PCT).

The problem to be solved by the present invention may therefore be regarded as to design a surface scraper in a fluid basin, such as a clarification basin or like, or as an oil containment boom or like by which it is possible, in addition to restricting of oil that exists on the water, also to remove it since the scraper "lives" along with the surface of the water.

Neither the problem or the solution is mentioned in D1, in which the scraper is metallic and the sprocket chain coupling element is particularly adapted to be used where it is subjected to torsional strains not commonly found in chains of the usual type, and thus the amended claims of the present application the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in the amended claims is novel and is considered to involve an inventive step. The invention is industrially applicable.

Among the other cited prior art documents, D3 and D4 show scraper-beam arrangements for scraping of substance in a liquid basin while D2 shows a conveyor chain for mining machinery and these documents only represent examples of the general state of the art.

Claims:

1. Scraper, which is meant to be used particularly as a surface scraper in a fluid basin, such as a clarification basin or like, or as an oil containment boom or like and, which comprises an elongated, at least tension transmitting flexible structure, which is formed of formed pieces (X), being coupled with each other one after the other in a longitudinal direction (s) and that are arranged known as such to twist in respect with each other in the first place (w1) round an axis standing in a direction of height (h) and on the other hand (w2) round an essentially longitudinal axis (s) by means of a joint arrangement (N; N'), comprising edge projections (N1), existing in a preceding formed piece one below the other in the direction of height (h) of the formed piece, and a centre projection (N2), existing in the following formed piece and that is to be placed between the above edge projections, **characterized** in that the specific weight of the scraper is arranged essentially lighter than water by using a formed piece (X) with a hollow frame (XR) particularly in order to enable its use filled with air or flotation material.

2. Scraper according to claim 1, **characterized** in that in an essentially stiff-structured frame (XR) of the formed piece (X) there is arranged, preferably on quick-release principle, a removeably attachable skirt part (XH), which is manufactured from essentially softer/more flexible material than the frame (XR) of the formed piece.

3. Scraper according to claim 1 or 2, **characterized** in that in the lower part of the formed piece (X), such as at a lower edge of a skirt part (XH), there is arranged an auxiliary weight arrangement

(LP) particularly for keeping a floating formed piece in an essentially vertical position.

5 4. Scraper according to claim 2 or 3, **characterized** in that the frame (XR) of the formed piece is manufactured from polypropylene or like and the skirt part (XH) from polyurethane, rubber or like.

10 5. Scraper according to any of the preceding claims 2-4, **characterized** in that the skirt part (XH) has fin-like or like stiffening/sealing arrangements (XHL, XHL'), projecting outwards (r) from its outer surface and which are arranged to enable twisting (wl) of the successive formed pieces with respect to each other round a rotation axis existing essentially in the direction of height (h).

20 6. Scraper according to claim 5, **characterized** in that a bottom fin (XHL') belonging to the stiffening/sealing arrangement is arranged to rise in the direction of height (h) towards the other end of the formed piece (X) particularly to enable twisting of the successive formed pieces with respect to each other on so called lap joint -principle.

25 7. Scraper according to claim 1, the joint arrangement (N; N') of which comprises a hole (R) for a joint pin (T) or a like in said projections (N1, N2), the hole existing essentially in the direction of height (h), **characterized** in that the upper and lower edges of the centre projection (N2) are arranged arched and the hole therein (R; R') to expand, when viewed in a cross section, from the centre projection's (N2) middle towards its upper and lower edges.

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8. Scraper according to any of the preceding claims 1 - 7, **characterized** in that each formed piece (X) of the scraper is mutually alike in a way that on

its first joint surface there are edge projections (N1)
and on the other joint surface there exists the centre
projection (N2).